

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

1. (Canceled)
2. (Currently Amended) The process of claim 13 ~~[[12]]~~ wherein the metal ions contained in the waste metal plating stream comprise one of ~~solution is comprised of the metal ions~~ cadmium, cobalt, copper, lead, nickel, zinc, chromium, or precious metal ions or mixtures thereof.
3. (Currently Amended) The process of claim 13 ~~[[12]]~~ wherein the metal ions contained in the waste metal plating stream are ~~solution is comprised of~~ nickel metal ions.
4. (Currently Amended) The process of claim 13 ~~[[12]]~~ wherein the metal ions contained in the waste metal plating stream are ~~solution is comprised of~~ copper metal ions.
5. (Currently Amended) The process of claim 12 wherein the porous cathodes are comprised of sintered powder nickel having a porosity of 5 to 100 pores/inch (PPI).
6. (Currently Amended) The process of claim 12 wherein the waste plating stream ~~solution~~ has a nickel ~~metal~~ ion content of at least 200 g/liter.
7. (Currently Amended) The process of claim 12 wherein the waste metal plating stream ~~solution~~ is subjected to metal deposition and upon ~~wherein the solution~~ exiting the electrochemical cell assembly has a nickel ~~metal~~ ion content as low as 50 g/ liter.
8. (Currently Amended) The process of claim 12 wherein the deposited nickel ~~metal~~ on the cathodes of the electrochemical cell assembly is fractured into pieces and is used as a source of

the nickel metal ions to be deposited in the subsequent metal plating process in an electrochemical deposition of the metal.

9-11. (Canceled)

12. (Currently Amended) A method of recovering metal from waste plating stream and using the recovered metal comprising:

providing a metal plating system comprising a soluble anode that provides nickel ions to a plating solution and a cathode that provides a substrate to be deposited with the nickel ions;

providing an aqueous rinse bath for washing the substrate after deposition of some of the nickel ions on the substrate;

providing a waste metal plating stream from the aqueous rinse bath containing an aqueous solution that includes nickel ions that did not deposit onto the substrate metal ions in an aqueous solution;

passing the waste metal plating stream containing the metal ions into an electrochemical cell assembly having an inlet for the waste metal plating stream, a plurality of alternating anodes and metallic cathodes porous to the waste metal solution plating stream, a plurality of ceramic diaphragms that separate the anodes and cathodes, and an exit from the electrochemical cell assembly, wherein the cathodes are formed from sintered powder nickel;

passing the waste metal plating stream through pores of the cathodes metallic cathode;

passing an electrical current through the anodes and metallic cathodes of the electrochemical cell assembly, thereby depositing a portion of the nickel metal ions in the waste metal plating stream onto the cathodes and reducing the amount of the nickel ions metal ion in the waste metal plating stream solution from that in the introduced waste metal plating stream;
and

recycling the waste metal plating stream exiting the electrochemical cell assembly back to the aqueous rinse bath, and

using the recovered deposited nickel metal on one of the cathodes metallic cathode and the metallic cathode as the soluble anode in the metal plating system to provide a source of the nickel ions metal to be deposited on to a substrate in a subsequent metal plating process.[:;]

wherein a permeable ceramic diaphragm is used to separate the anodes and cathodes;

wherein the waste metal plating solution is comprised of nickel metal ions; and

wherein the waste metal plating solution is obtained from an aqueous rinse bath formed as a result of water washing a plated metal part after the deposition of the metal plate onto a substrate; and

wherein the aqueous solution exiting the electrochemical cell assembly, for removal of metal ions from the waste solution, is recycled back to the aqueous rinse bath.

13. (Currently Amended) A process method comprising:

providing a metal plating system comprising a soluble anode that provides metal ions to a plating solution and a cathode that provides a substrate to be deposited with the metal ions;

providing an aqueous rinse bath for washing the substrate after deposition of some of the metal ions on the substrate;

providing a waste metal plating stream from the aqueous rinse bath containing metal ions that did not deposit onto the substrate in an aqueous solution;

passing the said waste metal plating stream containing said metal ions into an electrochemical cell assembly having an inlet for the said waste metal plating stream, a plurality of alternating anodes and metallic cathodes porous to the said waste metal solution plating stream, a plurality of ceramic diaphragms that separate the anodes and cathodes, and an exit from the electrochemical cell assembly;

passing said waste metal plating stream through pores of at least one of the said plurality of metallic cathodes;

passing an electrical current through the said plurality of alternating anodes and metallic cathodes, thereby depositing a portion of the said metal ions onto at least one of the plurality of metallic cathodes and reducing the amount of the said metal ions in the waste metal plating stream said aqueous solution;

removing the said at least one of the said plurality of metallic cathodes from the said electrochemical cell assembly;

recovering the said portion of the said metal ions deposited on the from said at least one of the said plurality of metallic cathodes by fracturing the said deposited portion into pieces to provide fractured recovered portions and removing the said fractured recovered portions of said metal ions from the said at least one of the said plurality of metallic cathodes;

using the said fractured recovered portions in the metal plating system ~~of said metal ions~~ as a source of the metal ions to be deposited ~~onto a substrate~~ in a subsequent metal plating process; and

reintroducing the said at least one of the said plurality of metallic cathodes without the said recovered portion of the said metal ions to the said electrochemical cell assembly to continue removing metal ions from the waste metal plating stream.

14. (Currently Amended) The method of claim 13, further comprising:

cutting the said fractured pieces of the deposited metal into smaller pieces prior to utilizing the said fractured pieces as a source of the metal ions in the metal plating system ~~said electrochemical deposition of the metal~~.

15. (Currently Amended) The method of claim 8 [[12]], further comprising:

cutting the said fractured pieces of the deposited nickel metal into smaller pieces prior to utilizing the said fractured pieces as the said source of nickel metal ions in the metal plating system ~~said electrochemical deposition of the metal~~.